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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,321	01/03/2002	Souichi Okada	1405.1055	8896

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EXAMINER

PARTHASARATHY, PRAMILA

ART UNIT	PAPER NUMBER
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2136

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/034,321

Applicant(s)

OKADA ET AL.

Examiner

Pramila Parthasarathy

Art Unit

2136

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 13-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

1. This action is in response to the communication filed on January 19, 2006. No new Claims have been added. Claims 1 – 15 are pending.

### ***Response to Remarks/Arguments***

2. Applicant's remarks/arguments filed on January 19, 2006, with respect to Claims 1 – 15, have been fully considered but they are not persuasive.

Referring to the previous Office action, Examiner had cited relevant portions of the references as a means to illustrate the system as taught by the prior art. As a means of providing further clarification as to what is taught by the references used in the first office action, Examiner has expanded the teachings for comprehensibility while maintaining the same grounds of rejection of the claims.

3. Yup et al. (U.S. Patent Number 6,937,727), teaches a circuit for implementing the Advanced Encryption Standard (AES) block cipher algorithm in a system having a plurality of channels, comprising round key generation means for selectively receiving a cipher key and generating a round key of a first predetermined bit length from the received cipher key a predetermined number of times based on the AES Rijndael key expansion algorithm. Yup further discloses outputting an encrypted/decrypted data string of the first predetermined bit length.

4. Regarding independent Claim 1, Applicant argues that Yup does not teach “a first selector that segments input data into execution block lengths smaller than said processing block length”, “a second selector that outputs to said first Round key addition circuit one output from among the outputs of said first selector, intermediate register/Shift Row transformation circuit, Byte Sub transformation circuit, or Mix column transformation circuit” and “an intermediate register/shift Row transformation circuit that temporarily stores the output of said first Round key addition circuit and executes shift row transformation using said processing block length”. These arguments are not persuasive.

Yup teaches, “a first selector that segments input data into execution block lengths smaller than said processing block length” (Column 4 line 40 – Column 5 line 2), “a second selector that outputs to said first Round key addition circuit one output from among the outputs of said first selector, intermediate register/Shift Row transformation circuit, Byte Sub transformation circuit, or Mix column transformation circuit” (Column 6 lines 5 – 61) and “an intermediate register/shift Row transformation circuit that temporarily stores the output of said first Round key addition circuit and executes shift row transformation using said processing block length” (Column 7 lines 8 – 16). Applicant does not explicitly recite “a first selector selects a 32-bit data block from this input register”; “an input register receives and temporarily stores input data” and “depending upon the current processing round, the second selector is set to a different position and sends one of the listed input values to the first round key addition circuit”.

5. Applicant clearly has failed to explicitly identify specific claim limitations, which would define a patentable distinction over prior arts. Therefore, the examiner respectfully asserts that cited prior art does teach or suggest the subject matter broadly recited in independent Claim 1. Dependent claims 2 – 15 are also rejected at least by virtue of their dependency on independent claims and by other reason set forth in this office action.

Accordingly, the rejection for the pending Claims 1 – 15 is respectfully maintained.

### ***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1 – 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Yup et al. (U.S. Patent Number 6,937,727).

Regarding Claim 1, Yup teaches a first selector that segments input data into execution block lengths smaller than said processing block length; a first Round Key Addition circuit that adds said round key value to input data for each said execution block length (Column 1 line 16 – Column 2 line 46 and Column 4 line 40 – Column 5 line 2);

an intermediate register/shift Row transformation circuit that temporarily stores the output of said first Round Key Addition circuit and executes Shift Row transformation using said processing block length (Column 1 line 16 – Column 2 line 46 and Column 4 line 64 – Column 5 line 14);

a Byte Sub transformation circuit wherein said intermediate register/shift Row transformation circuit value is inputted for each said execution block length and Byte Sub transformation is executed; a second Round Key Addition circuit wherein said intermediate register/shift Row transformation circuit value is inputted for each said execution block length and said round key value is added for each said execution block length (Column 1 line 16 – Column 2 line 46 and Column 7 lines 8 – 16);

a Mix Column transformation circuit executing Mix Column transformation on the output of said second Round Key Addition circuit (Column 1 line 16 – Column 2 line 46 and Column 7 lines 8 – 16); and

a second selector that outputs to said first Round Key Addition circuit one output from among the outputs of said first selector, intermediate register/shift Row transformation circuit, Byte Sub transformation circuit, or Mix Column transformation circuit (Column 1 line 16 – Column 2 line 46; Column 6 lines 5 – 61; and Column 7 lines 8 – 16).

Claim 2 is rejected applied as above in rejecting Claim 1. Furthermore, Yup teaches wherein said execution block length is a multiple of 8 bits (Column 1 line 16 – Column 2 line 46 and Column 4 lines 40 – 55).

Claim 3 is rejected applied as above in rejecting Claim 1. Furthermore, Yup teaches wherein said processing block length is 128 bits and said execution block length is 32 bits (Column 1 line 16 – Column 2 line 46 and Column 4 line 40 – Column 5 line 5).

Claim 4 is rejected applied as above in rejecting Claim 1. Furthermore, Yup teaches wherein the key length of the cipher key is any of 128 bits, 192 bits or 256 bits (Column 2 lines 28 – 46 and Column 4 line 40 – Column 5 line 5).

Claim 5 is rejected applied as above in rejecting Claim 1. Furthermore, Yup teaches said Byte Sub transformation circuit comprises a matrix operation unit for decryption that executes a matrix operation on input data (Column 1 line 16 – Column 2 line 46);

a third selector that outputs either the input data or the output of said matrix operation unit for decryption (Column 1 line 16 – Column 2 line 46);

an inverse operation unit for executing an inverse operation on the data outputted from said third selector; a matrix operation unit for encryption that executes a matrix operation on the data outputted from said inverse operation unit; a fourth selector that outputs either the output of said inverse operation unit or the output of said matrix unit for encryption (Column 1 line 16 – Column 2 line 46 and Column 8 line 41 – Column 9 line 31).

Claim 8 is rejected applied as above in rejecting Claim 1. Furthermore, Yup teaches wherein said intermediate register/shift Row transformation circuit can be used for both encryption and decryption through the reversal of order of input of shift data relating to amount of shift for data to be inputted into said intermediate register/shift Row transformation circuit, the input order for decryption being the reverse of the order for encryption (Column 1 line 16 – Column 2 line 46 and Column 8 line 41 – Column 9 line 31).

Claim 9 is rejected applied as above in rejecting Claim 1. Furthermore, Yup teaches wherein said Mix Column transformation circuit comprises a plurality of multiplication units with unique multipliers and an XOR circuit that performs XOR operations for said plurality of multiplication units, said Mix Column transformation circuit executing a matrix operation between data inputted into each multiplication unit and the multiplier established for each multiplication unit (Column 1 line 16 – Column 2 line 46 and Column 8 line 41 – Column 9 line 31).

Claim 6 is rejected applied as above in rejecting Claim 5. Furthermore, Yup teaches said matrix operation unit for decryption and said matrix operation unit for encryption comprises an XOR circuit so as to perform 8-bit operations at one clock cycle (Column 1 line 16 – Column 2 line 46 and Column 4 lines 40 – 55).



Claim 7 is rejected applied as above in rejecting Claim 5. Furthermore, Yup teaches wherein said matrix operation unit for decryption and said matrix operation unit for encryption comprises an XOR circuit so as to perform 1-bit operations at one clock cycle (Column 1 line 16 – Column 2 line 46 and Column 4 lines 40 – Column 5 line 5).

Claim 10 is rejected applied as above in rejecting Claim 9. Furthermore, Yup teaches wherein said Mix Column circuit transformation comprises 4 operation units having 4 multiplication units capable of 8-bit unit operations and XOR circuits that execute XOR operations based on the outputs of said 4 multiplication units (Column 1 line 16 – Column 2 line 46 and Column 4 lines 40 – 55).

Claim 11 is rejected applied as above in rejecting Claim 10. Furthermore, Yup teaches wherein said multiplication units can control 2 multipliers and are used for both encryption and decryption (Column 1 line 16 – Column 2 line 46 and Column 8 line 41 – Column 9 line 31).

Claim 12 is rejected applied as above in rejecting Claim 11. Furthermore, Yup teaches wherein said multiplication units are constituted to control addition values from high-order bits (Column 1 line 16 – Column 2 line 46 and Column 8 line 41 – Column 9 line 31).

***Allowable Subject Matter***

7. Claims 13 – 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

8. Applicant is urged to consider the references. However, the references should be evaluated by what they suggest to one versed in the art, rather than by their specific disclosure. If applicants are aware of any better prior art than those are cited, they are required to bring the prior art to the attention of the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pramila Parthasarathy whose telephone number is 571-272-3866. The examiner can normally be reached on 8:00a.m. To 5:00p.m.. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on 571-232-3795. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR only. For more information about the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pramila Parthasarathy  
March 05, 2006.

  
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